

REMARKS

The Title currently reads "PLATINUM TEMPERATURE SENSOR AND METHOD FOR PRODUCING SAME". For the purpose of accuracy, the words "AND METHOD FOR PRODUCING SAME" are deleted by this amendment to indicate more accurately the material covered by the claims of the application. Approval of the amendment of the title is respectfully requested by Applicant.

It is noted that the claims remaining in this divisional application (claims 5 and 14 - 17) were rejected in the parent application as obvious from Friese (USP 5,181,007) in view of Tani (USP 5,735,606) or Murata (USP 4,901,051), and also as obvious from Friese in view of Tani and Wienand (USP 5,831,512).

It is submitted that the subject matter of claim 5 is patentable over Friese for the following reasons:

According to Friese, the platinum resistor is a thick-film resistor. Contrary to the position stated in the Final Office Action of the parent application, this thick-film resistor according to Friese cannot be replaced by a thin-film resistor. According to Friese, two films 1 and 11 are sintered together making use of ceramic frames 4 and 4'. See Friese, column 6, line 61 to column 7, line 28 (description of Example 2). Thus, according to Friese, the ceramic films which are laminated and sintered together are ceramic green films. When laminating and sintering ceramic green sheets together, it is not possible to make use of a thin-film resistor for the following reasons:

In the thick-film techniques taught by Friese, suspensions and pastes based on metal or cermet are applied to produce resistor tracks, see column 2, lines 32 to 37 of Friese. Such suspensions and pastes can be sintered together with ceramic films (i.e. ceramic green sheets) onto which same are applied since the thick-film paste includes a metal particle content of about 85% and for the rest ingredients which volatilize during firing or sintering. Thus, making use of thick-film resistor tracks, a small fraction of the thick-film paste volatilizes only so that such thick-film resistor tracks can be used in the method of Friese.

For producing a thin-film resistor track having a sufficient thickness (of about 1 μm) it is necessary to apply a number of thin layers (of a thickness of about 0.1 μm each) of a thin-film paste, wherein the respective thin sheets have to be fired before the next sheet is applied, since the thin-film paste comprises a metal in atomic form of a fraction of about 10 to 15% only and for the rest ingredients which volatilize during firing. Due to this large fraction of volatile ingredients it is not possible to fire the thin-film paste together with the ceramic green sheets.

Thus it is readily apparent from the above that a thin-film resistor track cannot be used in the PTC temperature sensor of Friese.

According to the present invention, making use of a thin-film resistor is possible because two ceramic substrates which have been fired before connecting them by means of a connecting frame made of glaze are used.

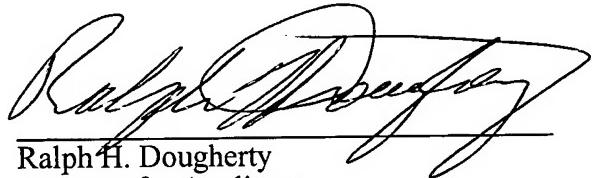
Friese applies the thick-film resistor to an insulating layer 3 rather than to the surface of a ceramic substrate. According to Friese, the insulating layer cannot be omitted in view of the electrical characteristics of YSZ at high temperatures.

Also according to Friese, the ceramic films 1 and 11 are not connected directly by means of the frames 4 and 4' but the insulating layers 3 and 3" are arranged therebetween.

The YSZ frames 4 and 4" do not represent a "glaze" in the sense of the technique defined in the present application. A glaze in that sense is more than a "smooth, thin, shiny coating", which definition is derived from a Dictionary (Webster's II, New Riverside University Dictionary) without any relation to a specific technique. In the field of sensors and, in particular, in temperature sensors, the term "glaze" (English language translation of the German language term "Glasur") means glass which has been molten at a specific temperature, and such a glaze is characterized in that it can be repeatedly molten at the same temperature. Contrary thereto, a YSZ green sheet which has been fired or sintered by heating to a sintering temperature cannot be molten again by heating the sintered YSZ to the sintering temperature. Thus, the YSZ frame of Friese does not represent a glaze frame as defined in the present application.

Entry of the Amendment substituting the attached substitute specification and claims is respectfully requested by Applicant. Consideration of the foregoing remarks is also respectfully requested by Applicant.

Respectfully submitted,



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